

Reply to Reviewer#1

General comments:

The authors added 20 more simulations to their analysis using different physical schemes. As the individual simulations basically agree with each other the results did become more robust. It is indeed very interesting to see how well the Medicane is reproducible with the different set ups. The PWG method was described in more detail and also the description of Medicane dynamics was improved. The novelty of the article was now stated more clearly in the abstract and conclusions. Therefore my general and specific comments were taken into account.

The main point still to be solved is the language of the article. There is a large number of smaller misspellings, missing or wrongly placed punctuation marks, many grammatical errors or sentences which are hardly or not at all understandable. In the former version the English was generally o.k., but in the new version especially the revised parts have to be improved before the article can be published.

Thank you very much for reviewing our revised manuscript and giving more useful comments on our revised manuscript. Please note that any corrections/revision corresponding to the reviewer's comments in the revised manuscript are shown in blue colour for clarity. We carefully read our manuscript again to improve our English.

Please note that "Ibiza" was replaced with "Menorca". That was geographic error in the previous manuscripts.

Reply to Reviewer#2 Dr. Emmanouli Flaounas

I read the revised version carefully and I found the manuscript to be improved. Most of my comments and suggestions were adequately addressed, although I find that English could be still improved. Nevertheless, the text is understandable and the messages are clear. I only have some minor languages comments on the corrections done by the authors.

Thank you very much for reviewing our revised manuscript and giving more useful comments on our revised manuscript. Please note that our response and any corrections/revision corresponding to the reviewer's comments in the revised manuscript are shown in blue colour for clarity. We carefully read our manuscript again to improve our English.

Please note that "Ibiza" was replaced with "Menorca". That was geographic error in the previous manuscripts.

Line 63: "medicanes"

Corrected.

Line 65: "delta"? This could become more precise?

We added (difference between future and present climate)

Line 67: "most of the medicane characteristics moderately intensify". Either be more precise or remain to a more general remark, e.g. the cyclone is fairly unchanged.

Yes, that is why we wrote after this sentence like "e.g., wind speed, uprake of water vapour and precipitation". These are intensified characteristics of the medicane.

Line 68: what is the "maximum depression of sea level pressure (SLP) minimum"?

Rephrased to minimum sea level pressure (SLP)

Line 81 "insights into", what is the "anthropogenic warmer ocean"?

Corrected and removed anthropogenic.

Line 91: "amounts"

Corrected.

Line 93: Please remove "nations".

Removed.

Lines 93-99: I suggest to rephrase. A high number of cyclonic storms may occur during a year. However, it is only few of them that qualify as medicanes mainly due to phenomenological criteria such as cloud-free "eye". I suggest to remove Lines 97-99.

Rephrased and lines 97-99 are removed. Please see lines 93-96.

Line 101: What similarities are you referring to? If this is the "eye" formation then I suggest to better articulate with the previous paragraph.

We added "which is just one of characteristics of tropical cyclones in the previous paragraph". Please see lines 95-96.

Line 106: This temperature range is not homogeneous in the Mediterranean Sea. IT is my impression that 23 degrees is rarely reached in the areas where medicanes are more frequently developed.

Here, we argue how cold the SST is in the Mediterranean Sea compared to the threshold of tropical cyclone generations over the tropical oceans.

Line 110: "triggered" instead of "preceded".

Replaced.

Line 122: I would say that the case study of Fita and Flaounas (2018) is not relevant to tropical transition. This is indeed contradictory with statement in line 275.

We removed Fita and Flaounas (2018) from this line.

Lines 127-130: I do not understand this part.

We deleted this part from the manuscript.

Line 131: "...some cases... involves tropical transition". Please provide details and references on the cases where tropical transition was relevant and how TT was involved.

As a reference of tropical transtion, we cited Mazza et al (2017). At line 120, we added "due to the warm seclusion".

Since we realized line131 does not connect with the rest of this paragraph, we rephrased that part in order to have a good flow of description. Please see lines 125.

Line 170: What tropical cyclone-like characteristics are you referring to?

We added "deep warm core". Please see line 163.

Line 189: It seems quite odd to start figures narrative with a reference to supplement material.

We moved that paragraph after the model setting. Please see lines 217-225.

Line 312: Here and throughout the manuscript, please be more careful when describing the processes. The development of the cyclone "can be linked" to convection which in turn can be favoured by air-sea exchanges.

Yes, because this paper's main aim is not on the fundamental mechanism of medicane Rolf, we have not used any strong expressions for mechanism of the medicane.

Line 316: "Decrease" instead of "reduce".

Corrected.

Line 317: Awkward phrasing.

Rephrased. Please see lines 316-317.

Line 320-322: I am not sure I understand this phrase. Is by "grid box" meant a grid point? If so, why this value is representative for the cyclone processes if it only refers to a very localised peak?

Yes, it means a grid point. Here, we would like to compare the maximum value of latent heat flux between our case and other cases of medicanes from the reference. As the reviewer says, it is much better to compare some averaged value like our Figure 6, but it is impossible to have the averaged latent heat flux of other medicanes cases in the reference. Therefore, here, we just showed maximum value of latent heat flux for quick comparison.

Line 324: "enhance evaporation more effectively". This is awkward phrasing. Is it meant that warmer SSTs may favour evaporation in the other studies, compared to Rolf here?

Yes. We rephrased it. Please see line 322-323.

Lines 333-334: I am not sure that I understand the definition of MWS. Why it is not just the 95th percentile of wind speed of all grid points within an area of 250 km from cyclones centre?

That is what we estimated the MWS. We missed to describe within a area of 250km from cyclone centre. We added it. Please see line 332.

Line 336-337: How can two different fields with different units vary consistently? Do you mean that they both increase and decrease in phase?

Because the MWS grids are concentrated around the medicane centre where the SLP gradient is intense. The stronger SLP gradient, the stronger SLP depression is. Therefore, the MWS and SLP show some coherent variation.

Lines 427-432: There are multiple repetitions here. Please rephrase to clarify the content.

We removed the repetitive expression here.

Line 468: what is meant by "similar"? Is it meant that both take place in the same time?

Here, we refer to the phase shift of the simulated medicane in PGW_{ATMS} and it is similar to the phase shift in PRS and PGW_{ALL} .

Line 469-472: "development of a deep warm core is not as strong...". What is meant by "strong development"?

We removed this sentence because of repetitive expression. Please see lines 471-474.

Line 474: Perhaps "present climate" instead of "present day"?

Replaced.

Line 487: Either be more precise, or remove this phrase so that the S2 is not necessary for understanding the content.

We removed the sentence.

Line 550: what is meant by "activated efficiently"?

We changed it to "enhanced".

Line 622: I am not sure what is meant by "source of medicanes".

We changed it to "that is an initial disturbance for medicanes". Please line 623-624.

Line 627: Please be more precise on "some impact". Is it fair to say that the background has a limited impact on the development of the medicane?

Here, we would like to conclude that the background has not large, but certain influence on the medicane as we showed the response of wind and precipitation. Therefore, we changed "some" to "moderate". Please see line 628.